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Advanced Traveler Information Service (ATIS):
Who are ATIS Customers?

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OUTLINE

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INTRODUCTION

This paper offers answers to "Who are ATIS Customers?" using different, complementary research and evaluation approaches. The first section, entitled External Factors Influencing Customer Demand, offers an empirical assessment of external conditions that appear to be critical to strong consumer demand for ATIS services.

The second section, entitled Using Attitudes and Values to Segment the ATIS Market, describes a general population survey that was used to segment the population according to their attitudes and values toward time, technology, travel, and information. This analysis forms the basis for understanding how ATIS customers differ from others who share similar demographic characteristics. The same survey was included with all MMDI customer satisfaction surveys, and enabled us to identify and segment actual ATIS customers. This is described in the third section, Classification of MMDI Customers.

The sections entitled ATIS Traffic Customer Characteristics and ATIS Transit Customer Characteristics provide customer characteristic trends drawn from MMDI customer satisfaction surveys of the Puget Sound Traffic Conditions web site, *TrafficTV* in Seattle,

[1] In particular, S.R. Mehndiratta, M.A. Kemp, J.E. Lappin, E. Nierenberg (1999), "Who are the Likely Users of ATIS? Evidence from the Seattle Region" prepared for presentation at the 79th annual meeting of the Transportation Research Board, Washington, DC, January, 2000; and, S.R. Mehndiratta, M.A. Kemp, C. Cluett (1999), "Traveler Information User Profiles" prepared as part of the MMDI Customer Satisfaction report.

Metro Online transit web site in Seattle, TransitWatch® real-time bus departure times at two transit centers in Seattle, *TrafficCheck* traffic television in Tempe, Arizona; and, observations of customer use of the Trailmaster travel conditions web site in Phoenix, and the Transguide travel conditions web site in San Antonio.

EXTERNAL FACTORS INFLUENCING CUSTOMER DEMAND

Findings from the MMDI evaluation and other research suggests that customer demand for ATIS ***traffic*** services is predicated on four factors:

1. The regional traffic context;
2. The quality of the ATIS services;
3. The individual trip characteristics; and,
4. The characteristics of the traveler.

The regional traffic context includes attributes of the region, such as highway-roadway network and capacity, levels of traffic congestion, and future highway-roadway expansion plans. Prime ATIS markets appear to be highly congested regions that have limited build-out options, constrained alternate route possibilities, and frequent unpredictable traffic events (e.g., weather, crashes, over-turned truck).

The quality of the ATIS services is at least as important as the level of network congestion. Information quality determines whether, how frequently, and with what level of confidence the traveler consults traveler information. Quality determines whether the information will meet customer needs with respect to personal benefit and value.

The trip purpose, the time of the trip in relation to peak congestion periods, trip length, and the particular route or route choices available to the individual traveler all have a significant effect on whether the individual will consult traffic information. To a limited extent, the availability and convenience of alternative mode choices for a given trip affects use of ATIS. And travel time flexibility, or lack thereof, is another determinant in the choice to consult traffic information.

The fourth factor includes values and attitude characteristics of the user, or potential user, of ATIS products and services, which are important determinants of user awareness, use patterns, behavioral responses, and valuation of ATIS. For example, these characteristics include attitudes towards timeliness, a desire to be in touch at all times, and a preference to ask a person for assistance rather than use a computer.

Conditions that suggest high demand for ATIS ***transit*** services are not as well studied, but appear to be related to the complexity of the transit network and services, the age of the transit rider population, and the level of technological sophistication of the ridership. Younger riders expect transit information to be as easily accessed as that provided by any market-based service. Their expectations are probably conditioned by the current service economy and by information available on the Internet. Technologically sophisticated riders are aware of many of the tools available for tracking cars and busses, and can

easily imagine the personal benefits of real-time transit status information, in addition to the other services that advanced media can provide.

USING ATTITUDES AND VALUES TO SEGMENT THE ATIS MARKET

Potential customer interest in innovative products or services are found to vary by *attitudinal* factors, such as attitudes to taking risks, to dealing with complicated equipment, or to change in general. Sometimes these relevant attitudes are associated with demographic or socioeconomic factors, but they may not be. In other words, exploring how customer acceptance and customer satisfaction vary with attitudes can contribute *additional* insights into the structure of (actual or potential) demand, beyond those deriving from the more common demographic or behavioral descriptors.

In an effort to define ATIS-relevant market segments, a set of attitudinal and values statements were included in an ITS supplement to the 1997 Puget Sound Regional Council (PSRC) Household Travel survey, which was mailed to ~2,000 representative households in the Puget Sound region[2]. Responses were analyzed using factor and then cluster analyses, which produced eight distinct market segments accounting for 90% of the PSRC sample. Described below are the segments that have been found to include many MMDI ATIS customers.

- ***Control seekers***

This segment constituted 19% of the PSRC sample, and had the highest incidence of likely ATIS users. These individuals are more likely (than the sample) to be *budget conscious*, to *plan ahead*, and to want to be *accessible* at all times. They also express a higher desire to predict travel time accurately when traveling than the rest of the sample. This is so even though they do not express a similar concern about being on time. *Control* and *knowledge*, rather than punctuality, seem to drive their desire for predicting travel times.

This segment is characterized by a very high use of technology and gadgets. Besides high ownership of computers at home, the segment is also defined by high levels of use of *portable* devices such as laptops and cellular phones. The use of portable devices, which is consistent with their desire to be accessible, definitely makes them attractive consumers of ATIS.

In terms of demographics, individuals in this market segment are slightly more likely to be female (58% female, versus 53% for the sample overall). Average household income for individuals in this market segment is no different statistically from the average household income in the full PSRC sample.

[2] Survey respondents registered their attitudes and values in reaction to statements on the subjects of technology, time, travel, and information using an 11-point agreement scale. The statements were drawn from focus group participants' discussions during an earlier ATIS user acceptance research project. See "User Acceptance of ATIS Products and Services: A report of qualitative research" (1997) by Charles River Associates and Volpe National Transportation Systems Center.

- ***Web heads***

This group (16% of the PSRC sample) is the most technologically savvy in the sample; its members are marked by very high usage of computers and the Internet both at home and at work. In contrast to the control-seeking segment, however, their usage of *portable* devices – mobile phones, portable computers, and pagers – is only low to moderate. Control over schedule seems to be an important issue, as members are more likely to report that they get annoyed by traffic delays, like to predict their travel times accurately, and worry a lot about being late. They are also more likely to budget their expenses carefully and are more amenable to planning ahead.

Demographically, this segment is younger and more male than the sample as a whole, and also a bit wealthier. Their household size is about average.

This segment takes slightly more trips, with a slightly longer average distance, than the full sample. Members of this group are quite likely to listen to radio traffic reports, but express some dissatisfaction with the quality of these reports. Presumably this dissatisfaction stems from infrequent updates or outdated information, as they report that their top priority for ATIS is that the information be kept up-to-date.

- ***Low-tech, pre-trip information seekers***

Relative to the rest of the sample, this group of respondents (22% of the sample) indicate that they are more likely to make changes in their travel patterns as a result of obtaining traffic information *before* leaving (i.e., postpone trip, change departure time, take new route or make changes in their route, including other stops) though they rarely make changes *while in transit.*

Accordingly, they report that they tend to prefer doing things the same way they have always done them, and are less likely to take risks with new products and services. Schedule control is again an important issue; they worry a lot about being late and do not mind planning ahead. They are older and slightly more male than the sample as a whole, and are less comfortable with technology – for example, they prefer to ask a person for information rather than rely on a computer. Members of this group can be expected to make greater use of Traffic TV, rather than a traffic web site.

- ***Mellow Techies***

Very few of the *mellow techies* respondents (6%of the PSRC sample) stated that they currently use traffic or transit information. They have little interest in traffic conditions or trip planning, and little concern about being late, but - like webheads - they have high levels of computer and Internet use. These individuals are more willing to take risks with new products and services, less averse to new ways of doing things, and more willing to use a computer to get information. And unlike the web-heads, they are less likely to insist on finding their own way rather than ask directions.

CLASSIFICATION OF MMDI CUSTOMERS

All MMDI customer satisfaction survey respondents completed a battery of attitude and values agreement statements similar to those included in the PSRC population survey. This enabled segmentation of MMDI ATIS customers using the profiles that were established by the PSRC segmentation. Once completed, we were able to see which segments were represented among actual ATIS users, and the differences between the segments in terms of how they used the services, and what they found valuable. Please refer to Table 1 on the following page for a tabular presentation of the segments discussed below.

Our analysis suggests that a *vast majority of web-based ATIS users are "web-heads" or "control seekers."* Sixty-six percent of the WSDOT web-site respondents were classified as either *control seekers* (40%) or *web-heads* (26%). Similarly sixty-three percent of the Metro Online respondents were classified into one of these two market segments (39% web-heads and 24% control seekers). An even higher portion of the most frequent users of Metro Online were classified into the web-heads segment (48%). In contrast, our analysis of the *general* population PSRC survey indicated that these two segments together constitute only about 35% of the total population.

"Web-heads" do not constitute a significant user group for non-web based ATIS services. The classification of the users of the other non-web based ATIS services, Transit Watch®, *TrafficTV* and *TrafficCheck* yielded many fewer individuals classified as web-heads, though both surveys yielded a high number of control seekers. 37% of the Transit Watch® users (the respondents who indicated that they "sometimes: or "always" looked at the Transit Watch® monitor) were classified as control seekers. Relatively few respondents (14%) were classified as web-heads. Similarly, control seekers made up 37%, and web-heads 15%, of the users in the Seattle *TrafficTV* sample (respondents who used *TrafficTV* at least once a week). Correspondingly, control seekers constituted 33% and web-heads accounted for 9% of the users of *TrafficCheck*.

For non web-based services, "low-tech pre-trip information seekers" constitute a significant user group. In case of the Transit Watch® users, 15% of the respondents were classified as part of this segment. They also accounted for 12% of the *TrafficTV* users and 17% of the Tempe *TrafficCheck* users, and even higher portions of the frequent users of these services (20% among the frequent users of *TrafficTV* and 21% among the frequent users of *TrafficCheck).* The PSRC analysis identified this segment as a good source of ATIS consumers – information seeking and willing to change their travel behavior in response to traffic/transit information – but for one caveat: these individuals are not as comfortable with technology in general, and computers in particular, as the rest of the population. Thus, it is not surprising that members of this segment are a significant share of the Transit Watch®, *TrafficCheck,* and *TrafficTV* user populations, but not a significant share of the user populations of the more technologically demanding WSDOT and Metro Online web sites.

Table 1. ATIS Segmentation of Survey Respondents

PSRC Baseline Panel and MMDI Surveys	Distribution of ATIS Market Segments				
	Control Seekers	Web Heads	Low-Tech Pre-Trip Info Seekers	Mellow Techies	Other Segments
PSRC Baseline Panel Survey, Wave 7 – Seattle, WA					
Percent in indicated segment (N=4142)	19%	16%	22%	6%	36%
WSDOT Traffic Information Web Site – Seattle, WA					
Percent in indicated segment (N=522)	40%	26%	3%	14%	17%
- Amongst frequent users of WSDOT web site (N=146)	42%	25%	1%	15%	17%
KC Metro Online Transit Web Site – Seattle, WA					
Percent in indicated segment (N=542)	24%	39%	7%	11%	19%
- Amongst frequent users of Metro Online web site (N=50)	24%	48%	4%	8%	16%
***Transit Watch* Bus Status Monitors – Seattle, WA**					
Percent of users in indicated segment (N=259)	37%	14%	15%	9%	24%
- Amongst frequent users of *Transit Watch* (N=117)	41%	11%	18%	6%	24%
***TrafficTV* Cable Traffic TV – Seattle, WA**					
Percent of users in indicated segment (N=199)	37%	15%	12%	13%	25%
- Amongst frequent users of *TrafficTV* (N=40)	38%	10%	20%	13%	21%
***TrafficCheck* Cable Traffic TV – Tempe, AZ**					
Percent of users in indicated segment (N=337)	33%	9%	17%	7%	35%
- Amongst frequent users of *TrafficCheck* (N=128)	30%	6%	21%	5%	37%

Control Seekers: Like to plan ahead, desire to be accessible at all times, like using portable information devices, and want to predict travel time accurately.

Web Heads: Most technologically savvy segment, high users of Internet, but low use of portable information devices.

Low-tech Pre-trip Information Seekers: Prefer pre-trip information, and are less interested in new high technology gadgets.

Mellow Techies: Little interest in traffic conditions or trip planning, and little concern about being late, but high levels of computer and internet use.

Other Segments:

Buyers of Value-added Services: Low comfort with computers and Internet, may prefer customized information services.

Wired with Children: Younger, higher income, with more children in household, seeks convenience in information acquisition.

Trendy and Casual: Use pagers and cell phones, but express little interest in traffic information or time savings.

Male Techno-Phobes: Less comfortable with technology, less likely to change behavior, less interest in traffic information.

Notes: "Users" are defined as those who report having used that ATIS service. "Frequent users" are defined below. Note that, due to measurement error, component sample sizes may differ somewhat from those shown in the respective individual reports.

- Transit Watch: Respondents who report that they "always" use the Transit Watch monitors
- WSDOT: Respondents who report accessing the web site 30 or more times per month
- KC Metro: Respondents who report accessing the web site more than 10 times in the past 4 weeks
- Seattle Traffic TV: Respondents who report watching the broadcasts more than once a week
- Tempe Traffic Check TV: Respondents who report watching the broadcasts more than once a week

The "mellow techies" are a consistent user group. A significant number of ATIS users across most of the projects were consistently classified as part of the mellow techies segment. Fourteen percent of the WSDOT web-site respondents, 11% of the Metro Online respondents, 7% of *TrafficCheck* users, and 13% of the *TrafficTV* users were classified as part of this segment.

Different kinds of users have different demands of ATIS. We found some noteworthy differences in patterns of use and expectations of respondents from different segments: *Web-heads*, true to their name, seem most enamoured with the Internet as a medium for obtaining information. For example, they are more likely to say that it is much easier to get Metro Bus information over the Web than via any other source. At the same time, they seem very concerned about the quality of the information they receive, and are very demanding in this regard. Indeed, they are more likely than others to describe themselves as dissatisfied with the accuracy of the information they receive on the WSDOT web page.

In contrast, *low-tech pre-trip information seekers* generally report very high levels of satisfaction with the information they receive. People in this segment are more likely to say that the information they received from the WSDOT web site helped them save time and avoid unsafe driving conditions. Part of this satisfaction may stem from the fact that they are more likely to report that they check the Metro Online web site *only* when they suspect that services are not operating normally. Perhaps because they limit their use of ATIS to those occasions (e.g., service disruptions) where it is likely to be of most use, they are more satisfied with the information they receive than those who are constantly scanning the web in search of a quicker route home.

Within the *low-tech pre-trip information seekers* segment, we also see some interest in value-added services, such as "one button" access to information. Metro Online survey respondents in this segment were significantly more likely to say that they would just like to enter their starting and ending points and have the system figure out the best bus route(s) to take.

ATIS TRAFFIC CUSTOMER CHARACTERISTICS

The previous sections discussed how we used ATIS-related attitudes and values to identify and describe ATIS customer segments among respondents to a survey of a general population. In this section, and in the following section on transit customer characteristics, generalizations are drawn from ATIS customer surveys. These surveys highlight customer trends, but because survey respondents are a self-selected sample, we cannot generalize the observations to a larger population of all ATIS customers.

- ***In general***

Survey results suggest that ATIS customers are employed commuters who spend a large proportion of their commute in congested traffic, drive more of their commute on freeways than on local streets, and can select among alternate freeway segments. They are better educated than average, have higher than average incomes, are of prime working

age, concentrated between the ages of 26 and 46, and somewhat more likely to be male. ATIS customers usually have work time flexibility, although use of ATIS pre-trip in the morning by fixed-arrival commuters is also significant.

- ***More frequent users***

The most frequent users are commuters who experience greater congestion delay in their work trips than other customers. In Seattle, frequent web site users reported that 2/3 of their commute trip time is attributable to traffic congestion. In other words, 20 minutes of a 30-minute commute are due to traffic congestion. Frequent TrafficTV viewers have a similarly large commute delay. Frequent web site users have more commute time flexibility, frequent traffic television viewers in Phoenix have less flexibility in their work schedule.

Not surprisingly, more frequent users, regardless of access media, are much more satisfied with the quality of the information provided and with the coverage of their routes.

- ***Different media attract different customer segments***

There appear to be differences in ATIS customer profiles as a function of which media they use to access information. Specifically, cable television viewers appear to be older, less educated, less technologically experienced, and have lower incomes than ATIS customers who access information on the web.

Those who use the web as their ATIS source are more likely to have mobile phones, pagers, Internet access at home and at work, and PDAs. Web customers are more concerned with predicting trip duration than being on time. They are more frequently time managers, not time clock punchers.

Technology plays a complex role, both as a barrier to use (discomfort with technology precludes use of web-based services) and as an attraction, as some web users (*webheads* and *mellow techies*, in particular) are uninterested in using any other media for information. So, in regions like Seattle, web-based services are more likely to be more successful than in an equally congested but less technically savvy region.

- ***Trip characteristics influence use***

The decision to consult ATIS is based upon the expectation or experience of significant traffic congestion delay. Commute trips generally inspire the greatest demand for ATIS, with commuters using ATIS more frequently for their return trip from work in the afternoon. Web site use hits a peak during the morning commute and then climbs towards a second, higher peak during the afternoon and early evening. This suggests that there are many customers who use ATIS during the day, for work-related and personal trips.

In Seattle, which is one of the most congested regions in the country, customers also consult traffic information for weekend trips, for shopping, errands, and destinations related to festivals or other traffic-impact events. This suggests that a service of equal or

better quality in a similarly congested region would be used beyond the five-day a week commute, creating more value for customers.

ATIS TRANSIT CUSTOMER CHARATERISTICS

The ***Metro Online*** ATIS web site provides customers with extensive, static, system information. During the evaluation period, a real-time service called ***BusView*** was being tested on the Metro Online site. Twenty-five percent of the Metro Online customer survey respondents had also used BusView.

Metro Online customers are younger than average riders and more highly educated. They have access to the web at home and at work or school. Their income distribution, their longevity and intensity of bus use, and their access to a car, is similar to the average rider.

BusView respondents were more likely to be men. By comparison to other respondents, they were longer-term users of Metro Online, and more intensive users.

Segmentation of Metro Online customers using the segments defined above shows that most of its customers come from one of two user segments: *webheads* (39%) and *control-seekers* (24%). It is interesting to note that whereas webheads are the largest segment of transit web site users, control-seekers are the largest segment of traffic web site users.

TransitWatch® provides real-time bus departure times on video monitors at two major transit centers in Seattle. Customers were identified by their responses to a survey administered to a representative sample of all riders who used the transit centers. Customers are slightly younger than non-users, more educated, and more technologically sophisticated. There were no differences in income or sex between customers and non-users.

Customers are more intensive users of the bus service, and have less commute-time flexibility. They are more likely to be impatient, critical of the systems on-time performance, more likely to want to be reachable at all times, and more interested in seeking out information.

Segmentation of TransitWatch® customers shows that most users come from one of three groups: *control-seekers* (37%), *low-tech pre-trip information seekers* (15%), and *webheads* (14%). The segmentation highlights the differences in customer segments related to media: webheads are less interested in information that is not on the web, and low-tech information seekers are not represented at all among customers who use the web.

CONCLUSIONS

Based on evaluation findings to date, a high-demand ATIS market appears to be a function of several regional factors and the quality of the ATIS services, more so than any individual ATIS customer characteristics. While it is likely that there will be ATIS

customers where these external conditions do not exist, the greater number of customers will be found in regions where traffic and highway network conditions, transit system complexity, and ATIS service quality all align. Further, it seems unlikely that there will be strong consumer demand for fee-based ATIS services in regions that do not meet these criteria.

Almost all ATIS customers are employed commuters. The greatest use of ATIS is during peak commute hours. More ATIS traffic customers are male, but among ATIS transit customers, use rates by gender is about even. Based on the MMDI survey trends, distinguishing factors are the ATIS customers' mode of transport, commute trip characteristics, level of education, age, and comfort with advanced technology.

ATIS market segmentation based on attitudes and values related to control, time, travel, and technology successfully identifies much of the current ATIS customer market, differentiating ATIS customers from others with similar demographic characteristics.

Control-seekers dominate the ATIS customer market. These customers consult ATIS to save time, to use their time efficiently, to stay on schedule, and to stay informed. Control-seekers use information more intensively than the general population.

Technology has an important and complex role in ATIS. Webheads comprise the second largest group of ATIS customers. However, their allegiance appears linked to the Internet media, and may or may not migrate to other platforms as web-based information becomes more mobile.

Individuals in the *low-tech pre-trip information seekers* market segment had a low acceptance and comfort level with the Internet and web-based information. Consistent with this characterization, individuals belonging to this segment comprised much larger shares of the Transit Watch®, *TrafficTV* and *TrafficCheck* user populations. Nevertheless, this customer segment represents a large portion of the current ATIS customer pool, and can be expected to continue to demand good information services on low-tech media in the future.